

CLAIMS

What is claimed is:

1. A wood preservative composition comprising an aqueous solution of:
 - 5 a. a copper complex of a chelating compound comprising at least two functional groups selected from the group of amidoxime, hydroxamic acid, thiohydroxamic acid, N-hydroxyurea, N-hydroxycarbamate, and N-nitroso-alkyl-hydroxylamine; and
 - 10 b. ammonia, ethanolamine, or pyridine in an amount sufficient to solubilize the copper complex.
2. The wood preservative composition of Claim 1, wherein the chelating compound comprises at least two functional groups selected from amidoxime and hydroxamic acid, and the amidoxime or hydroxamic
15 acid is derived from a cyanoethylated compound.
3. The wood preservative composition of Claim 2, wherein the cyanoethylated compound is derived from the cyanoethylation of:
 - 20 a. a primary amine, a secondary amine, blood albumin, casein, gelatin, gluten, soybean protein, wool, or corn zein; or
 - b. materials derived from blood albumin, casein, gelatin, gluten, soybean protein, wool, or corn zein.
4. The wood preservative composition of Claim 2, wherein the cyanoethylated compound is derived from the cyanoethylation of synthetic
25 polymers selected from the group of acetone-formaldehyde condensate; acetone-isobutyraldehyde condensate; methyl ethyl ketone-formaldehyde condensate; poly(allyl alcohol); poly(crotyl alcohol); poly(3-chloroallyl alcohol); ethylene-carbon monoxide copolymers; polyketone from propylene, ethylene and carbon monoxide; poly(methallyl alcohol);
30 poly(methyl vinyl ketone); and poly(vinyl alcohol).
5. The wood preservative composition of Claim 2, wherein the cyanoethylated compound is obtained from the cyanoethylation of materials selected from the group of:
 - 35 a. alcohols, carbohydrates, dextran, dextrin, gums, starches, modified natural polymers; and
 - b. compounds derived from natural polymers.

6. The wood preservative composition of Claim 2, wherein the cyanoethylated compound is obtained from the cyanoethylation of sucrose or sorbitol.

5 7. The wood preservative composition of Claim 5, wherein the gums are selected from the group of guar, locust bean, honey locust, flame tree, tara, arabic, tragacanth, and karaya gums.

8. The wood preservative composition of Claim 5, wherein the starches are selected from the group of starches derived from corn, potato, tapioca, or wheat.

10 9. The wood preservative composition of Claim 5, wherein the modified natural polymers are selected from the group of regenerated cellulose, cellulose xanthate, dimethylthiourethane of cellulose, ethyl cellulose, ethylthiourethane of cellulose, hydroxyethylcellulose, methylcellulose, and phenylthiourethane of cellulose.

15 10. The wood preservative composition of Claim 5, wherein the natural polymer is selected from the group of flax, jute, sisal, and manila.

11. The wood preservative composition of Claim 1, wherein the chelating compound comprises at least two amidoxime or hydroxamic acid groups, and the chelating compound is derived from polyacrylonitrile, or
20 from a copolymer of acrylonitrile and vinyl monomers.

12. The wood preservative composition of Claim 1, wherein the chelating compound comprises at least two hydroxamic groups and the chelating compound is derived from styrene-maleic anhydride or poly(vinylmethylether/maleic anhydride) copolymers.

25 13. A process for preparing a copper complex, comprising:
a. forming an aqueous mixture of a cyanoethylation catalyst and an alcohol or amine;
b. adding an unsaturated nitrile to the aqueous mixture of (a) and allowing the unsaturated nitrile to react with the
30 alcohol or amine;
c. adding a source of hydroxylamine, together with ammonium hydroxide, ethanolamine, or pyridine to the aqueous solution of step (b); and
d. adding a source of Cu(II) to the aqueous solution of step
35 (c) to form a copper complex.

14. The process of Claim 13, wherein the alcohol is sucrose or sorbitol.

15. The process of Claim 13, wherein the amine is a primary or secondary amine having 1 to 30 carbon atoms, or is polyethyleneamine.
16. The process of Claim 13, wherein the source of hydroxylamine is hydroxylamine, hydroxylamine hydrochloride, or hydroxylamine sulfate.
- 5 17. The process of Claim 13, wherein the cyanoethylation catalyst is a catalytically effective amount of lithium hydroxide, sodium hydroxide, or potassium hydroxide.
18. The process of Claim 13, wherein the unsaturated nitrile is acrylonitrile.
- 10 19. The process of Claim 13, wherein the source of copper is selected from the group of copper sulfate, copper sulfate pentahydrate, cupric chloride, cupric acetate, and basic copper carbonate.
- 15 20. A process for preparing a wood preservative composition, comprising contacting an aqueous solution comprising a copper salt, at least one chelating compound comprising at least two functional groups selected from the group of amidoxime, hydroxamic acid, thiohydroxamic acid, N-hydroxyurea, N-hydroxycarbamate, and N-nitroso-alkyl-hydroxylamine, with ammonia, ethanolamine, or pyridine.
- 20 21. A process for preserving an article, comprising contacting an article selected from the group of wood, lumber, plywood, oriented strand board, cellulose, hemicellulose, lignin, cotton, or paper with the wood preservative composition of Claim 1.
22. The process of Claim 21, wherein contacting comprises dipping, brushing, spraying, draw-coating, rolling, or pressure-treating.
- 25 23. The process of Claim 21, wherein the article is wood or lumber.
24. The process of Claim 21, further comprising subjecting the wood or lumber to vacuum both before and after contacting the wood or lumber with the wood preservative composition of Claim 1.
- 30 25. An article treated with the wood preservative composition of Claim 1.
26. The article of Claim 25, wherein the article is selected from the group of wood, paper, cellulose, cotton, lignin, and hemicellulose.
- 35 27. An article selected from the group of wood, lumber, plywood, oriented strandboard, paper, cellulose, cotton, lignin and hemicellulose, further comprising copper and at least one chelating compound, wherein the chelating compound comprises at least two functional groups selected from the group of amidoxime, hydroxamic acid, thiohydroxamic acid, N-hydroxyurea, N-hydroxycarbamate, and N-nitroso-alkyl-hydroxylamine.